

IN THE SPECIFICATION:

On page 5, please amend paragraph ¶[0021] as follows:

-- [0021] In the embodiment depicted in Figure 2 (or FIG. 4 as discussed below), the grooved-surface 12 has a sinusoidal profile 22 in only a single direction. Given a sinusoid period of about 1.0 μm and the amplitude of about 0.3 μm , the surface area for the sinusoidal grooved-surface is 1.67 times surface of a flat surface. For a given surface anchoring energy, the total surface energy of a grooved surface is about 60% higher than a flat surface. Figure 2 depicts the LCD device 99 with a grooved under-layer surface 12 having a sinusoidal profile 22 and a DLC or inorganic material layer alignment film 20, and additionally an over-layer substrate 100 is shown provided having a grooved-surface 112 of a sinusoidal profile 122 and includes a DLC or inorganic material layer alignment film 120. It is understood thus, that an LCD device 99 of the invention may include bottom and top substrates that both have grooved surfaces and DLC or inorganic material layer alignment films 20, 120, or, have one surface (top or bottom) that may be grooved with a DLC or inorganic layer alignment film. For instance, Fig. 4 illustrates an LCD device 99' including a top over-layer substrate 100' having a flat surface profile and flat alignment film layer 120' formed thereon according to an alternate embodiment of the invention. Besides DLC, other inorganic material layer alignment films include SiN_x , hydrogenated amorphous silicon, SiC , SiO_2 , glass, Al_2O_3 , CeO_2 , SnO_2 , ZnTiO_2 , InTiO_2 , InZnO_2 , and other organic or inorganic dielectric materials and conducting materials.--

On page 6, please amend paragraph ¶[0022] as follows:

--[0022] As shown in Figure 2, the effect of providing a grooved surface 12 is that the liquid crystal (LC) molecules 30 align parallel to the grooves (i.e., an axial groove aligned state) rather than perpendicular to the grooves (i.e., a 90-deg meta-stable alignment state) because the latter alignment requires a higher free energy than the former. For the example embodiment depicted in Figure 2, the calculated energy for molecules to align perpendicular to the grooves is approximately 3.4 times higher than that for the molecules to align parallel to the grooves. To

illustrate, Fig. 6 depicts an LC D molecule 301 sitting inside a groove alignment layer in a direction parallel to the ion beam bombardment direction parallel to the grooves, the molecule having a lower potential energy than molecule 302 that is sitting on a ridge of the groove (i.e., the 90-deg meta-stable alignment state).